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Observation of Carbon Dust in the DIII-D Divertor and SOL¹ D.L. RUDAKOV, A.YU. PIGAROV, R.D. SMIRNOV, J.H. YU, UCSD, W.P. WEST, C.P.C. WONG, GA, M. GROTH, M.E. FENSTERMACHER, LLNL, W.M. SOLOMON, PPPL — Dust accumulation is a serious safety concern for ITER. In DIII-D carbon dust is observed in divertor and scrape-off layer (SOL) by optical imaging. After an extended entry vent, thousands of dust particles are observed in the first 2-3 plasma discharges. Individual particles moving at velocities up to \sim 500 m/s, and breakup of larger particles into pieces are observed. After \sim 70 discharges, dust levels are reduced to a few observed events per discharge except in discharges with disruptions that produce significant amounts of dust. Using the divertor materials evaluation system (DiMES), micron-sized carbon dust is injected into DIII-D ELMing H-mode discharges. When the outer divertor strikepoint is swept onto DiMES, $\sim 2\%$ of the dust carbon content penetrates the core, raising the core carbon density by a factor of ~ 4 . Dust particles from the injection are observed in the outboard SOL. The observed dust trajectories and velocities are in qualitative agreement with the modeling of the 3D DustT code.

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